

## CLAIMS

1. A toner cartridge comprising:
  - a toner receptacle configured to accommodate toner, the toner receptacle having an opening; and
- 5 a receptacle holding member engaged with the toner receptacle such that the receptacle holding member covers or closes the opening and holds the toner receptacle rotatably, and as the toner receptacle rotates, toner in the toner receptacle passes to the receptacle holding member via the opening, wherein
  - the receptacle holding member includes a pipe insertion section on which an insertion passage is formed to insert a pipe member configured to be fixed to an image forming apparatus, and is formed such that the insertion passage extends along a direction parallel to a direction of axis of rotation of the toner receptacle.
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2. The toner cartridge according claim 1, wherein the receptacle holding member has a first engaging section configured to engage with a protrusion of the image forming apparatus that sticks out along a direction parallel to the direction of axis of rotation of the toner receptacle in a positioning member that is fixed to the image forming apparatus, in a position shifted from the axis of rotation of the toner receptacle.
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3. The toner cartridge according to claim 1, wherein the receptacle holding member has a second engaging section configured to engage with a recessed section of the image forming apparatus that is dented along a direction parallel to the direction of axis of rotation of the toner receptacle in a positioning member fixed to the image forming apparatus, in a position shifted from the axis of
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rotation of the toner receptacle.

4. The toner cartridge according to claim 2, wherein  
the receptacle holding member includes a toner storage  
section in which the toner is stored before being  
discharged out of the receptacle holding member, and  
the insertion passage extends along a direction  
parallel to the direction of axis of rotation of the toner  
receptacle, and is connected to the toner storage section.  
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5. The toner cartridge according to claim 1, wherein the  
toner receptacle has a shape of a long and slender cylinder  
along the direction of axis of rotation.

15 6. The toner cartridge according to claim 4, wherein a  
connecting passage that connects the insertion passage and  
the toner storage section of the receptacle holding member,  
the insertion passage, and the toner storage section are  
positioned in a line in this order in a direction  
20 orthogonal to the direction of axis of rotation.

7. The toner cartridge according to claim 6, wherein the  
connecting passage is provided such that it extends  
straightly in the direction orthogonal to the direction of  
25 axis of rotation.

8. The toner cartridge according to claim 7, wherein the  
connecting passage has a taper that tapers from the toner  
storage section to the insertion passage.

30 9. The toner cartridge according to claim 6, wherein a  
shutter member that closes an opening on the side of the  
insertion passage in the connecting passage is provided

such that it can slide between a position that closes the opening in the insertion passage and a position where it exposes the opening.

5 10. The toner cartridge according to claim 9, wherein a sealing member that seals a gap between the pipe insertion section and the shutter member in the insertion passage, is fixed to an inner wall of the insertion passage of the pipe insertion section.

10 11. The toner cartridge according to claim 10, wherein the sealing member is provided at a location in the insertion passage upstream than a location connecting with the connecting passage in a direction of insertion of the pipe member, and at a location in the insertion passage downstream than the location connecting with the connection passage in the direction of insertion of the pipe member.

15 12. The toner cartridge according to claim 11, wherein the shutter member has a diameter same as that of the pipe member .

20 13. The toner cartridge according to claim 1, wherein toner is accommodated in the toner receptacle.

25 14. The toner cartridge according to claim 13, wherein the toner is a refilled toner that is refilled into the toner receptacle after the toner receptacle becomes empty upon using the toner in an image forming apparatus.

30 15. The toner cartridge according to claim 13, wherein among a plurality of toner cartridges accommodating toners of different colors in the toner receptacles set in the

same image forming apparatus, a shape of a projection image of each of the toner receptacles in the direction of axis of rotation of the receptacle holding member is different.

- 5        16. The toner cartridge according to claim 1, wherein a connecting passage connects the insertion passage and a toner storage section in the receptacle holding member, and after toner sent from the toner receptacle to the receptacle holding member drops to the connecting passage,
- 10      the toner flows into the pipe member through the connecting passage to be discharged out of the receptacle holding member, and an airtightness between the insertion passage on a downstream side in a direction of transportation of toner from the connecting passage and the pipe member inserted into the insertion passage is superior than an airtightness between the toner receptacle on an upstream side in the direction of transportation of toner from the connecting passage and the receptacle holding member.
- 15      17. The toner cartridge according to claim 1, wherein a porous sealing member made of a porous material is provided between the toner receptacle and the receptacle holding member, and a non-porous sealing member made of a non-porous material is provided between the insertion passage and the pipe member, and therefore, an airtightness between the insertion passage and the pipe member is superior than an airtightness between the toner receptacle and the receptacle holding member.
- 20      18. The toner cartridge according to claim 16, wherein the receptacle holding member includes an engaging section configured to engage with the toner receptacle and an insertion section in which the insertion passage is formed,

the insertion section being configured to fit to the engaging section, and an airtightness between the engaging section and the insertion section is superior than an airtightness between the engaging section and the toner receptacle.

19. The toner cartridge according to claim 18, wherein a porous sealing member made of a porous material is provided between the toner receptacle and the receptacle holding member, and a non-porous sealing member made of a non-porous material is provided between the engaging section and the insertion section, and therefore, an airtightness between the engaging section and the insertion section is superior than an airtightness between the toner receptacle and the receptacle holding member.

20. The toner cartridge according to claim 17, wherein the porous sealing member is made of an elastic material, and the toner receptacle engaged with the receptacle holding member jams in the porous sealing member.

21. An image forming apparatus comprising:  
a toner image forming unit that forms a toner image on a recording body;  
a toner cartridge that accommodates toner to be supplied to the toner image forming unit and is detachable from the image forming apparatus; and  
a suction unit that sucks the toner in the toner cartridge and carries the toner to the toner image forming unit, wherein  
the toner cartridge includes  
a toner receptacle configured to accommodate toner, the toner receptacle having an opening, and

a receptacle holding member engaged with the toner receptacle such that the receptacle holding member covers or closes the opening and holds the toner receptacle rotatably, and as the toner receptacle rotates, toner in  
5 the toner receptacle passes to the receptacle holding member via the opening, wherein

the receptacle holding member includes a pipe insertion section on which an insertion passage is formed to insert a pipe member configured to be fixed to an image  
10 forming apparatus, and is formed such that the insertion passage extends along a direction parallel to a direction of axis of rotation of the toner receptacle, wherein

the suction unit sucks the toner in the receptacle holding member through the pipe member inserted into the  
15 insertion member.

22. The image forming apparatus according to claim 21, wherein, in the toner cartridge,

the receptacle holding member has a first  
20 engaging section configured to engage with a protrusion of the image forming apparatus that sticks out along a direction parallel to the direction of axis of rotation of the toner receptacle in a positioning member that is fixed to the image forming apparatus, in a position shifted from  
25 the axis of rotation of the toner receptacle,

the receptacle holding member includes a toner storage section in which the toner is stored before being discharged out of the receptacle holding member, and

the insertion passage extends along a direction  
30 parallel to the direction of axis of rotation of the toner receptacle, and is connected to the toner storage section,

and while mounting the toner cartridge on to the image forming apparatus, the first engaging section or the second

engaging section of the receptacle holding member is engaged with a protrusion or a recessed section of the positioning member before the pipe member is inserted into the insertion passage.

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23. The image forming apparatus according to claim 21, wherein the toner cartridge has a positioning member for positioning with respect to the image forming apparatus, wherein, in the toner cartridge,

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the receptacle holding member has a first engaging section configured to engage with a protrusion of the image forming apparatus that sticks out along a direction parallel to the direction of axis of rotation of the toner receptacle in a positioning member that is fixed to the image forming apparatus, in a position shifted from the axis of rotation of the toner receptacle,

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the receptacle holding member has a second engaging section configured to engage with a recessed section of the image forming apparatus that is dented along a direction parallel to the direction of axis of rotation of the toner receptacle in a positioning member fixed to the image forming apparatus, in a position shifted from the axis of rotation of the toner receptacle,

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the receptacle holding member includes a toner storage section in which the toner is stored before being discharged out of the receptacle holding member, and

the insertion passage extends along a direction parallel to the direction of axis of rotation of the toner receptacle, and is connected to the toner storage section,

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and the positioning member includes a protrusion or a recessed section that engages with the first engaging section or the second engaging section of the receptacle holding member.

24. An image forming apparatus that uses a toner cartridge including

a toner receptacle configured to accommodate  
5 toner, the toner receptacle having an opening; and  
a receptacle holding member engaged with the  
toner receptacle such that the receptacle holding member  
covers or closes the opening and holds the toner receptacle  
rotatably, and as the toner receptacle rotates, toner in  
10 the toner receptacle passes to the receptacle holding  
member via the opening, wherein

the receptacle holding member includes a pipe  
insertion section on which an insertion passage is formed  
to insert a pipe member configured to be fixed to an image  
15 forming apparatus, and is formed such that the insertion  
passage extends along a direction parallel to a direction  
of axis of rotation of the toner receptacle, wherein

a connecting passage connects the insertion passage  
and a toner storage section in the receptacle holding  
20 member, and after toner sent from the toner receptacle to  
the receptacle holding member drops to the connecting  
passage, the toner flows into the pipe member through the  
connecting passage to be discharged out of the receptacle  
holding member, and an airtightness between the insertion  
25 passage on a downstream side in a direction of  
transportation of toner from the connecting passage and the  
pipe member inserted into the insertion passage is superior  
than an airtightness between the toner receptacle on an  
upstream side in the direction of transportation of toner  
30 from the connecting passage and the receptacle holding  
member, the image forming apparatus comprising:

a carrier unit that carries the toner from the  
receptacle holding member to the toner image forming unit

via the pipe member by sucking the toner in the receptacle holding member through the pipe member.

25. A method of recycling a toner cartridge including a  
5 toner receptacle that accommodates toner and a receptacle holding member engaged with the toner receptacle such that the receptacle holding member covers an opening formed in the toner receptacle and holds the toner receptacle so that the toner receptacle can rotate, in which after the toner  
10 in the toner receptacle is sent to the receptacle holding member from the opening by rotation of the toner receptacle, the toner is discharged out of the receptacle holding member and then the toner is refilled in the toner receptacle, wherein

15 the receptacle holding member includes a pipe insertion section on which an insertion passage is formed to insert a pipe member configured to be fixed to an image forming apparatus, and is formed such that the insertion passage extends along a direction parallel to a direction  
20 of axis of rotation of the toner receptacle,  
the method comprising:

removing the toner receptacle from the receptacle holding member;  
refilling the toner in the toner receptacle after  
25 removing; and  
setting the toner receptacle on the receptacle holding member upon refilling.

26. A method of recycling a toner cartridge including a  
30 toner receptacle that accommodates toner and a receptacle holding member engaged with the toner receptacle such that the receptacle holding member covers an opening formed in the toner receptacle and holds the toner receptacle so that

the toner receptacle can rotate, in which after the toner in the toner receptacle is sent to the receptacle holding member from the opening by rotation of the toner receptacle, the toner is discharged out of the receptacle holding  
5 member and then the toner is refilled in the toner receptacle, wherein

the receptacle holding member includes a pipe insertion section on which an insertion passage is formed to insert a pipe member configured to be fixed to an image  
10 forming apparatus, and is formed such that the insertion passage extends along a direction parallel to a direction of axis of rotation of the toner receptacle,

the method comprising:  
cutting a hole in the toner receptacle for refilling  
15 the toner;  
refilling the toner in the toner receptacle through the hole; and  
closing the hole.